



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/737,042	10/30/1996	BJORN HEED	C-35620	4727
<div>7590 11/28/2007 DVORAK AND TRAUB 53 WEST JACKSON BOULEVARD CHICAGO, IL 60604</div>			<div>EXAMINER LEO, LEONARD R</div>	
			<div>ART UNIT 3744</div>	<div>PAPER NUMBER</div>
			<div>MAIL DATE 11/28/2007</div>	<div>DELIVERY MODE PAPER</div>

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

CW

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 08/737,042

MAILED

Filing Date: October 30, 1996

NOV 28 2007

Appellant(s): HEED, BJORN

Group 3700

Keith H. Orum
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 15, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

Art Unit: 3744

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

800,500	ACV (Soviet Union)	2-1981
1,339,542	USHER (Great Britain)	12-1973
4,407,357	HULTGREN	10-1983

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over ACV (SU 800,500) in view of Usher.

ACV discloses a recuperative heat exchanger comprising a casing having inlet and outlet ports 2-5; a heat transfer package having a plurality of connected rectangular planar elements with a corrugated pattern extending the entire length and width thereof, the planar elements

Art Unit: 3744

being folded in an accordion-like manner along fold lines 7; but does not disclose corrugations greater than 45 degrees with respect to the longitudinal flow direction.

Usher discloses a heat exchanger for 2 fluids comprising a plurality of rectangular planar elements (Figures 1-4); wherein the angle of the ridges and channels are 30 degrees with respect to the width of the plate (i.e. 60 degrees with respect to the length of the plate) for the purpose of achieving optimal heat exchange (page 3, lines 31-49).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in ACV corrugations extending at an angle more than 45 degrees with respect to the net flow path for the purpose of achieving optimal heat exchange as recognized by Usher.

Claims 7-8 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over ACV in view of Usher as applied to claims 5 and 9 above, and further in view of Hultgren.

The combined teachings of ACV and Usher lacks top and bottom end covering elements.

Hultgren discloses a heat exchanger comprising a casing 2 defined by top and bottom ends 3 and lengthwise 5 and width-wise 4 sidewalls having inlet and outlet ports 7-10; a heat transfer package 11 (20) having a plurality of connected rectangular planar elements 24 with corrugations 17, the planar elements being folded in an accordion-like manner; and top and bottom end covering elements 13 (Figure 1, column 3, line 67 to column 4, line 2) for the purpose of ease of assembly and manufacture.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in ACV top and bottom end covering elements for the purpose of ease of assembly and manufacture as recognized by Hultgren.

(10) Response to Argument

With respect to section A of appellant's brief, one skilled in the art of heat exchange *would* combine ACV with Usher. The secondary reference of Usher explicitly teaches one of ordinary skill in the art to employ corrugations extending at an angle more than 45 degrees with respect to the net flow path for the purpose of achieving optimal heat exchange. As well known in the art of heat exchange, the corrugations of both ACV and Usher (page 3, lines 28-29) produce turbulence. In essence, the fluid flow is tripped and the thermal boundary layer along the plate is reduced. Usher (page 3, lines 31-49) clearly discloses, in analogous convention, the angle between the corrugations and longitudinal direction of the plate determines the heat transfer coefficient, where an angle greater than 45 degrees provides improved heat transfer by increasing the flow resistance and turbulence along the plate. For example, in the extreme instances, corrugations at an angle of 90 degrees with respect to the longitudinal direction of the plate provides the maximum flow resistance and turbulence to the fluid flow, whereas corrugation at an angle of zero degrees with respect the longitudinal direction of the plate, i.e. aligned with the fluid flow, provides the minimum flow resistance and turbulence to the fluid flow. As disclosed by Usher, an angle of 45 degrees provides an intermediate heat transfer coefficient.

Although, Usher discloses several embodiments where the plural sections are disposed in the longitudinal direction of the plate, the teaching of varying the corrugation angles is applicable to a single section of corrugations as shown in Figures 1-2 of Usher. Appellant is reminded that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed

Art Unit: 3744

invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Furthermore, ACV discloses only a single section of corrugations. It is noted the term “nozzle” in appellant’s translation of ACV is misdescriptive. The device of ACV is employed in the same environment of appellant’s instant invention.

With respect to appellant’s argument of achieving “substantially thermally balanced flow distribution,” MPEP 2114 states in part, “[A]pparatus claims cover what a device *is*, not what a device *does*.” *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).” The recitation of “to exhibit a substantially thermally balanced flow distribution” is functional and contained in the “wherein/whereby” clause of the claims. Arguendo, the similar structure of the combination of ACV and Usher will function in a manner similar to appellant’s instant invention. Appellant has never argued the device of the combination of references is structurally different than the appealed claims, rather the functionality or problem solved differs. Furthermore, MPEP 2144 states in part, “The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. *It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. In re Linter*, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), cert. denied, 500 U.S. 904 (1991) (emphasis in original).”


Art Unit: 3744

Rather than reiterate the Examiner's position with respect to Hultgren, the remarks in the Office action mailed 6/4/2002 are believed applicable. However, the rejection of claims 7-8 and 10-11 merely employ Hultgren as a secondary reference to teach top and bottom end covering elements for the purpose of ease of assembly and manufacture.

Lastly, MPEP 2144 states in part, "The court held "it is not necessary in order to establish a *prima facie* case of obviousness . . . that there be a suggestion or expectation from *the prior art* that the claimed [invention] will have the same or a similar utility as *one newly discovered by applicant*," and concluded that here a *prima facie* case was established because "[t]he art provided the motivation to make the claimed compositions in the expectation that they would have similar properties." 919 F.2d at 693, 16 USPQ2d at 1901 (emphasis in original)."

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


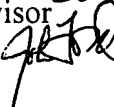

LEONARD R. LEO
PRIMARY EXAMINER
ART UNIT 3744

June 18, 2007

Conferees

Eric Keasel, Supervisor

John Ford, Primary

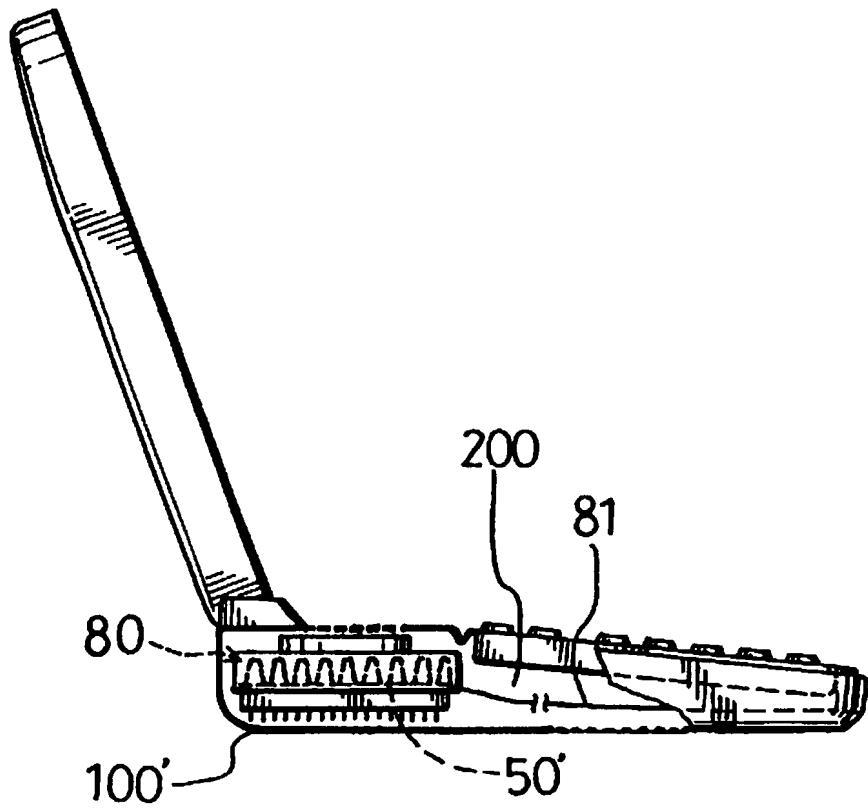


FIG. 6